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3. As zoospores are developed, place recently killed mosquitos, as many as you want preparations, in a watch glass with the infected fly, until they become infected. This requires only a few moments.

4. Place each mosquito in a hanging-drop culture, or other slide culture, in a moist chamber, for individual use.

There is just about enough nutrition in the mosquito to bring the *Saprolegnia* through the life-cycle, and not enough to give trouble with bacteria or infusoria. Since the slides can be transferred to the microscope at any time, without disturbing the culture, the life history of the fungus can be easily followed by even an elementary class. It offers a good laboratory exercise for noting the effects on life and development of changing conditions of temperature and the like.

CULTIVATION OF FRESH-WATER ALGÆ

Professor J. A. Nieuwland of Notre Dame University, has done a valuable service for teachers, and other workers with fresh-water algæ, by bringing together in the *Midland Naturalist* a series of suggestions relative to the conditions of successful culture and manipulation of these plants. Among them are the following:

1. Best use small aquaria (one to two gallons) for most algæ. Larger aquaria encourage the growth of *Cladophora*, and entomotraca, worms, insects, etc., which are not helpful to the small algæ.

2. Do not put much material in the jars. Often a very small amount (1 cu. in. to the gallon of water) is best.

3. Remove crustacea and insects. *Utricularia* placed in the jars will aid in this removal of the smaller crustacea.

4. In transplanting, retain as nearly as possible the conditions under which the plants were growing in nature. Use, so far as possible, the very water in which they are found growing. Never allow complete change of water. If necessary to add water, use only a small percent of the total; and if necessary to take it from tap, allow it to run 5 or 10 minutes before letting it pass into the jar. If water is too hard, *Chara* will help to correct it.

5. Cover the bottom of the jars with an inch of well-washed sand. This, as well as the vessels, should be thoroly disinfected with formaldehyde if they have had *Oscillatoria* growing upon

them. This precaution should always be taken if the higher algæ are wanted.

6. Even if the vegetative portions should disappear, it is better not to throw away the material, unless it is foul with the small, dark blue *Oscillatoria*. Often after a period of rest, many valuable types will renew themselves; and, being better adjusted than at the beginning, may make remarkable success as cultures, and pass satisfactorily into the reproductive stages. Several types are reported by Professor Nieuwland as appearing year after year in the same jar.

7. In collecting, the best materials are usually to be had from small streams or ponds, in which the water almost or entirely dries up in summer or fall. It is good practise, even in the dry period, and particularly in winter when the vegetative stages of algæ may not be apparent, to collect some of the sticks, mud or soil, etc., from places in which desirable plants have been seen during the appropriate season. If this material is placed in laboratory jars, excellent laboratory cultures will often be developed in a few weeks. This indoor "forcing" of winter collections of algæ is a most decided aid to the teacher. It furnishes also a promising field of research for students in our laboratories.

8. On the other hand, by putting late-fruited species into jars, in the fall, and placing them in diffuse light in a cool place, they may be kept for weeks or even months with little change.

SUCCESSION OF MICRO-ORGANISMS IN FRESH WATER

Considerable interest has been shown recently by students, in the normal succession of micro-organisms in water, both in nature and in the somewhat artificial conditions of the laboratory. This is one of the phases of plankton work likely to be especially useful to teachers and to students. An especially well conceived and executed study of this sort has recently been reported and published by F. E. Fritch and F. Rich in the Proceedings of the Bristol Naturalists's Society for 1909. It extends over a period of five years and is from an inland body of water near Bristol.

The observers found that the dominant forms of algæ in the pond were *Cladophora*, *Spirogyra*, and numerous diatoms, both free-living and epiphytic. The chief subsidiary forms were *Edogonium*, *Mougeotia*, and various Cyanophyceæ. Among these forms the fol-